THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. VI. NOVEMBER, 1889. No. 11.

ON SOME RELATIONS BETWEEN THE DISEASES OF THE NOSE AND THE EYE.[1]

BY ADOLF BRONNER, M.D.,

Surgeon to the Bradford Eye and Ear Hospital.

In late years attention has frequently been drawn to the intimate relation between the diseases of the nose, and the diseases of the middle ear and throat; but we hear very little of the connection between the diseases of the nose and those of the eye.

The fact that the nose and eye are situated so very near together, that they are in direct connection with one another through the nasal duct, that the venous supply is in direct communication through the frontal veins, the lachrymal plexus, the ethmoidal veins and others, and that there is a very intimate reflex vasomotor connection, these facts are proof enough, that there must be a very intimate relation between the two organs. If we carefully go into the history of many cases of disease of the eye, we do in reality find that they are in close connection with some affection of the nose.

[1]Paper read before the British Larynogological and Rhinological Association, November, 1889.

In most cases of rhinitis, we find that the inflammation has spread up the nasal duct, thus causing the mucous membrane of the duct to swell, and preventing the free passage of tears into the nose; or, the inflammation has spread into the lachrymal sac, given rise to mucocele, and this causes and keeps up inflammation of the conjunctiva and cornea.

We all of us know how very difficult it is to cure some cases of epiphora, and how the affection returns again in spite of the most careful treatment by the ordinary methods; slitting open the canaliculus, passing tremendous probes, syringing out, etc. Now statistics prove that in about one-half of the cases of epiphora, the symptoms are caused by some stricture or affection in the canaliculi, or lachrymal sac. In about one-third of the cases there is no stricture, the lachrymal sac is not affected; the probe, if of any reasonable size, passes very readily, and we can find no cause for the epiphora, except a swelling of the mucous membrane of the nasal duct. The first class of cases are amenable to the usual methods of treatment, but in the latter, the epiphora returns again and again. And why? Simply because the seat of the disease is in the mucous membrane of the nose, and until we cure this, we cannot possibly prevent the inflammation from spreading up the nasal duct, and obstructing the free passage of the tears. I have, in late years, cured many cases of long standing epiphora, in which there was no stricture and no affection of the lachrymal sac simply by treating the mucous membrane of the nose.

Nearly all persons who suffer from chronic hypertrophic rhinitis are also subject to epiphora; the latter varies according to the swelling of the mucous membrane of the nose. When there is little swelling, or to put it more plainly, when the patient can breathe through the nose there is little or no epiphora. When the mucous membrane is swollen and the nostril is closed, the epiphora is well marked. These symptoms are very common indeed, at least in Yorkshire; but the ailment is so slight and varies so much, that in most cases the patients do not seek medical advice for the epiphora, and it is only when they come to you for the rhinitis that you see these cases. I have seen

very few cases of chronic rhinitis in which these symptoms were not well marked.

In most cases of mucocele or of abscess of the larchrymal sac, especially in cases of recurrent abscess, we find some affection of the corresponding side of the nares. Dr. Gruhn (*Centralblatt f. Augenheilkunde*, 1888, p. 438) found that out of 38 cases of mucocele the nose was affected in 36 cases. Faravelli de Kruch (*Annali di Ophthalmologia*, vi., 1887) reports that out of 35 cases the nose was affected in 30. I have at present, a young lady, from York, under treatment who is suffering from caries of the lower turbinated bones. She has had several abscesses of the left lachrymal sac which have been so carefully and well treated that the scars over the sac quite disfigure one side of the face. The nose had never been examined. Mucocele not only gives rise to epiphora, but in most cases, also to conjunctivitis, and often keratitis. In all cases of unilateral conjunctivitis we ought, therefore, to carefully examine the lachrymal sac and nares, just as in all cases of one-sided rhinitis or nasal polypi we ought always to examine the maxillary sinus.

There is a peculiar and typical affection of the conjunctiva and cornea, phylctænular or marginal keratitis, which is very common in children, and which has a great tendency to recur. If the eyes are once affected the disease is sure to recur several times a year for years. In these cases there is nearly always some affection of the nares. If we carefully treat and cure the rhinitis, the ophthalmia will probably not return again. I could relate many cases in hospital and private practice in which the ophthalmia recurred again and again, till the nose was also treated, and then the attacks ceased altogether.

In most cases of ozæna there is epiphora and conjunctivitis, and you often find ulcers of the cornea, which are very difficult to cure. Nieden (*Archiv f. Augenheilkunde*, xvi., p. 381) thinks that ozæna is partly due to the fact that the nasal duct is closed and that thus the tears cannot enter and moisten the mucous membrane of the nose. In all cases of hay-fever the conjunctiva is also affected.

Ziem (*Allgemeine Med. Central-Zeitung*, No. 23, 1886) draws

attention to the fact, that in most cases of granular lids there is also rhinitis. He thinks the rhinitis causes irritation of the conjunctiva, and that thus the conjunctiva is more liable to become affected by the trachoma bacilli, a statement which seems to me to be rather far-fetched.

I should like to say in a few words how very important it is, that, before performing any operation on the eye, we ought always to carefully examine the lachrymal passages and remove any obstruction or inflammation there may be there. At the Bradford Eye and Ear Hospital, before performing any operation which necessitates the opening of the eye, we always order the patient to use a sublimate eye lotion (1-5000) for some days before he enters the hospital. The day before the operation the lotion is applied frequently in the hospital.

There is another class of affections of the eye, to which I should particularly like to draw your attention. I refer to certain cases of muscular asthenopia, with norma l vision and accommodation, and also to cases of recurrent enlargement of the conjunctival vessels. I think, that I cannot better illustrate these affections than by recording in a few words two typical cases which have come under my notice:

Martin F., æt. 15 years, was brought to me in November, 1888, to get some glasses. For about a year he has not been able to read long together. After he has read for about fifteen minutes the eyes and forehead begin to ache and pain. He complains of severe frontal headache, worse in the morning. He has tried all kinds of glasses, had atropine applied for several weeks, without finding any relief whatever. If he does not use the eyes much, the pain decreases, but as soon as he tries to read the old pain returns as bad as ever. I found that the vision was perfect, very slight hypermetropia and slight weakness of accommodation. The fundus was congested. For about two years he has suffered from discharge from the nose, and has not been able to breathe through the nose for some time. I found hypertrophic rhinitis and post-nasal growths. I removed the growths, and applied the galvanocautery in the nares. In six to seven weeks the headache and

pain in the eyes have disappeared, he can read as well as ever and for any length of time, and the symptoms have not returned since.

Mr. T., æt. 28 years, saw me in May, 1888. For some months he has noticed that after the slightest irritation—if he smokes, sits up late, drinks a little—the eyes became red, and remained so for a day or two. He looks, as he says, as if he had been on the "spree." There were no subjective symptoms of conjunctivitis; in fact, he complained only of the redness of the eye. I found several large and tortuous vessels in the conjunctiva bulbi, and slight pericorneal injection. The lids were slightly swollen; the fundus was decidedly congested; vision and accommodation were normal.

Various kinds of lotions, cocaine, hot fomentations, and abscission of some of the larger vessels, failed to prevent recurrence of the symptoms. I examined the nares, found well marked chronic hypertrophic rhinitis, and applied the galvanocautery. In three weeks the symptoms had disappeared, never to return again.

Gruening (*Medical Record*, January, 1886), Ziem (*Allgemeine Med. Central-Zeitung*, No. 20, 1886), Bettman (*Journal of American Medical Association*, May, 1887), and Maxwell (*Ophthalmic Review*, October, 1888), record similar cases.

Ziem (*Berliner Klinische Wochenschrift*, 37, 1888), Berger (*Archiv f. Augenheilkunde*, xvii., p. 293); Woakes ("Nasal Polypus") and others have proved that some cases of chronic hypertrophic rhinitis and also empyema of the maxillary sinus can give rise to scintillating scotomata, amblyopia, contracted field of vision and glaucoma. Ziem relates one very interesting case of bilateral empyema of the maxillary sinus, in which one eye was affected with glaucoma, and in the other there was distinct dimness of vision and contracted field. After the treatment of the empyema, the eye symptoms disappeared. Ziem thinks that in these cases the symptoms are caused by venous congestion, through direct communication of the nasal and ophthalmic veins and not by any reflex vasomotor action.

Woakes ("Nasal Polypus," p. 63), says: "Occasionally one

"meets with defective vision in conjunction with disease of the "ethmoidal bone, and in these cases, when submitted to oph- "thalmoscopic examination, hyperæmia of the fundus has been "noted. Thus it would seem that the circulation of the eyeball, "as well as of the lachrymal gland, is in correlation with the nasal "mucous membrane, responding by way of vessel dilatation to "irritation of the latter. Nor will this circumstance excite sur- "prise when it is remembered that the various branches of the "ophthalmic artery receive their vasomotor nerves from pro- "longations of the upper cervical ganglion, through which "ganglion the vessel reflexes already traced have been seen to "operate."

Similar symptoms, dimness of vision and contraction of field of vision, have also been observed after the application of the galvano-cautery to the mucous membrane of the nose.

Berger (*Archiv Augenheilkunde* xvii., p. 293) records one case, and Ziem (*Centralblatt f. Augenheilkunde*, August, 1887), has seen three eases.

Hack (*Erfahrungen auf dem Gebiet der Nasenkrankheiten*, p. 36), published two cases of orbital neuralgia, which were cured by the application of the galvano-cautery, in one case, to some granulation tissue on the middle turbinated bone, and in the other to the middle turbinated bone itself. Nieden also records a case in which severe infra-orbital neuralgia was caused by rhinitis. Empyema of the maxillary sinus is a very common cause of orbital neuralgia Some weeks ago I saw a case of severe supra-orbital neuralgia, which had been going on for years, and which was at once cured, after I had syringed out the maxillary sinus from the middle meatus.

Tumors from the nares, frontal or maxillary sinuses, or empyema of the sinuses, often give rise to exophthalmus. Nieden records two cases of malignant tumors growing from the nares, followed by bilateral exophthalmus and death. I saw a similar case only a fortnight ago. The peculiarity of these cases is, that they begin as apparently ordinary nasal polypi, which bleed very readily, and which suddenly develop into rapidly spreading malignant tumors.

Hartmann (*Berliner Klinische Wochenschrift*, p. 325, 1884), records a case of orbital abscess following acute rhinitis. F. Konig (*Inaugural Dissertation, Bonn*, 1882) has collected forty-three cases of hydrops and empyema of the frontal sinus, which affected the orbit. Peltesohn (*Centralblatt f. Augenheilkunde*, p. 35, 1888), records three cases of empyema of the frontal sinus, which burst into the orbit. Nieden also reports a similar case.

These few facts prove that, in some cases at least, there is a close connection between the diseases of the nose and of the eye. They prove that, in these days of rapidly growing specialism, we should be careful not to forget that one organ, although it may have its special functions and special diseases, is still only a part of a part or of the whole, and that we ought always carefully to examine and see if the one disease be not in some connection with some affection of a neighboring organ, or with some constitutional disease.

EXPERIENCES WITH A CASE OF CHRONIC MIXED CLONIC AND TONIC BLEPHAROSPASMUS.

BY ADOLF ALT, M.D.

Cases of chronic clonic blepharospasmus are not so frequent that experiences in the treatment of such a case, as I shall relate later on, should not be of interest to our readers.

Before, however, recording this case, it may not be without value to collect in short words what some of the text-books which just happen to be on my desk, have to say about this affection.

Michel[1] says: In a large majority of the cases in which there is no known cause for the existence of the blepharospasmus, "pressure-points" may be found; when pressure is exerted on these points the spasms appear relieved, or even cease, or the patients have a sensation of increased sensibility, or even pain. These points are mostly where the supraorbital and infraorbital nerves leave the bone near the upper and lower orbital margin. In these cases the lid spasms are often but a part of a general facial spasm. * * *

* * * In the treatment we must consider the general condition of the patient and the possible causes; in neurasthenic and anæmic conditions, tonic treatment is necessary; inflammations of the eye, the conjunctiva, the cornea and the uveal tract must be treated. * * * In cases in which "pressure points" are found, the methods generally in use in the treatment of neuralgias must be applied, as the constant current, and in desperate cases, neurectomy.

Meyer[2] says: * * * By the term of blepharospasmus is

[2]Practical Treatise on Diseases of the Eye. Translated by F. Fergus, M.D., Philadelphia, 1887, p.

[1]Lehrbuch der Augenheilkunde. Wiesbaden, 1884 ,p 179.

generally meant the spasmodic occlusion of the palpebral fissure, whether it take place only intermittently, or last for some length of time.

This form of blepharospasmus may be due to various causes. * * * Often the blepharospasm is at first only intermittent, but becomes continuous and extends to the neighboring muscles, and even to those at some distance. This chiefly occurs in cases of general neurosis. In these cases, also, it has been observed that in the region supplied by the fifth pair there is a point where, if the nerve be compressed against the bone, the blepharospasm is made to cease. * * *

* * * If the blepharospasm remain even after the inflammatory concomitants have disappeared, or if it be determined by a neurosis of the fifth pair, we must ascertain whether compression in the course of one or the other of the branches of that nerve does not modify the spasmodic contractions, or does not cause them to cease altogether. The nerve which chiefly supplies the orbicularis with sensory fibres, is the supraorbital, and we, therefore, should begin our attempts at compression with it; but experience has shown that we should not stop with it, but also try the effect of compression on the infraorbital, the temporal branch of the molar, and the inferior dental.

When we have thus determined the point at which compression seems to act favorably on the contractions, we generally try the effect of subcutaneous injections of morphia at that situation. Nor should it be forgotten that the result often depends on the solution being injected exactly at that spot and in the centrifugal direction of the nerve. * * *

* * * Sometimes morphia injections, if repeated often enough, succeed in curing the disease; in other cases, however, they only procure a transitory amelioration. * * * It is in such cases that we are authorized to have recourse to a neurotomy or neurectomy. * * * If we have not been able to find a point at which compression of the nerve causes the blepharospasmus to cease, or if our neurotomy has not been followed with success, we must try the constant current.

Macnamara[3] says, after having spoken of nervous winking: * * * A far more serious form of blepharospasm is that in which the contractions are of a tonic kind, and either intermittent or continuous. Even when intermittent the disease is often most distressing, and attended with absolute danger to the patient, for he may be seized with a spasm of the lids at any moment, thus destroying his sight for the time; and supposing that he happens to be crossing a crowded street at this particular moment, he runs the risk of being thrown down and run over. Moreover, the affection is in other respects a most painful one, interfering, as it does, with work, and rendering the patient unfit for all useful employment. * * *

* * * The third class includes cases of neuralgic tic of the face, in which the morbid condition of the fifth nerve, especially its supraorbital branch, is propagated by reflex action to the seventh pair, causing spasm of the orbicularis. Malaria, rheumatism, sudden exposure to cold, irritation of the nerve by bony growths in its passage through the skull, or faulty digestion, may be mentioned as some of the most common causes of this form of blepharospasmus. * * *

* * * But in the third class of cases we should try to ascertain which of the branches of the fifth nerve is principally involved, and, as a guide to its discovery, we may exert pressure at different points of the surface—for example, over the exit of the supraorbital nerve—and notice if it influences the spasm of the lid; or, again, we may examine, in the same way, the inferior dental nerve at the dental foramen. If we can thus discover the point of departure of the irritation among the branches of the fifth, we may very probably, by division of the nerve, interrupt the chain of nervous actions on which the spasm of the orbicularis depends. It may be necessary to divide the nerves on both sides of the face; and at first the beneficial effect of the operation may not be very apparent, but gradually the spasm passes off, to the great relief of the patient. Unfortunately, after an apparent cure has been effected in this way, the disease will sometimes return.

[3] A Manual of the Diseases of the Eye. Philadelphia, 1882, p. 96.

Among other remedies which may be usefully employed for the relief of blepharospasmus, are electricity, the continuous current being used, and also subcutaneous injection of morphia. These should always be tried before we have recourse to surgical interference. * * *

Strange to say, I cannot find anything about the disease under consideration in the text-books by Nettleship, Higgins and Mittendorf. Nor it it necessary to consult any further text-books. The extracts given above agree in the essential points with each other.

Luckily, quite a number of these cases yield readily to the least heroic treatment, that is, morphine injections and the constant current. Yet, whether the cure is as often a permanent one, as we may think, I venture to doubt.

The following case is the most desperate one it has been my luck to have to attend to. With what effect I shall now relate.

On September 29, 1889. E. B., æt. 56 years, a small, poorly nourished individual, was led into my office for the first time to consult me on account of the inability "to keep his eyes open." The history that he gave, was, that about fourteen years previously, his eyes had begun to wink, the left one more than the right. The trouble grew gradually worse, in spite of treatments of all kinds. He had had morphine injections made and the constant current applied for months daily, had had glasses prescribed and his eyelids cauterized. He has been treated with all sorts of tonics, by starvation, and by all sorts of other therapeutic measures. He had gone from Pontius to Pilatus, but all to no avail. A prosperous business man when the trouble began, he had got rid of all his worldly possessions, and was deeply in debt to sympathizing friends. He could not venture on the street alone, and had had many hair-breadth escapes. He now came to me to try once more whether it was not possible to give him at least that much help, that he might be able to work a few hours a day at his trade, fine basket and cane work, and thus earn at least a living. He was ready to jump into

the river and end his miserable life, if nothing could be done for him.

While thus talking to me, the patient sat before me, a miserable sight, his lids most of the time closed tightly, while at intervals of several minutes a few clonic spasms would change the aspect, and allow him to get a momentary dim view of the surroundings. He could not keep one eye, nor even part of one, open for half a minute, in fact, he had not the slightest control over his eyelids. Pressure on the notch of the supraorbital margin where the supraorbital nerve emerges from the orbit, caused some pain, but the spasm seemed for a short time lessened, while pressure on both the supraorbital and the infraorbital nerves did so to a more marked degree.

After the instillation of a few drops of a 4% solution of cocaine the spasm was also relieved to a certain degree, sufficiently so, to enable me to examine the cornea and the conjunctival sac,and to make sure that there was nothing pathological in these membranes to account for reflex-spasms. The patient felt, however, so gratified when the cocaine had reached its full effect, that he begged me to see whether the repeated use of these drops would not allow him to do some work. I accordingly gave him a prescription for a cocaine solution, but, as I had expected, he returned the next day with the statement, that the effect, as pleasant as it was at first, was not lasting enough to be of value to him, and he even thought that he was worse after this effect had passed off.

I now advised neurectomy, but when it came to operating, he begged of me to try everything else first. Accordingly, I first stretched both orbicularis muscles forcibly by means of a spring-speculum. This manipulation acted for a short time quite well, but the effect did not last much longer than that of cocaine. As he was, however, not yet ready to have neurectomy performed, I next made myotomy at the outer canthus of each eye, guarding him against allowing the wounds to heal rapidly. This little operation had such a beneficial effect on the spasms of the lids, that he remained away from my office for almost two weeks, and did some work at his trade.

After that period he returned, not quite as bad as before, but still unable to keep his eyes open longer than a few minutes at a time. He was now ready to submit to the neurectomy at least of the supraorbital nerve of the left eye.

This operation I performed on December 4, with the kind assistance of Drs. Riesmeyer and Richter. After having made an incision through skin, muscle and tarso-orbital fascia along the upper orbital margin, the contents of the orbits were depressed, and the supraorbital nerve was cut as far back in the orbit as possible, and then at the incisura supraorbitalis. In this way a piece of nerve, nearly an inch long, was removed. The wound was closed by five sutures and healed *per primam*. The left forehead had, of course, lost all sensation.

When the bandage was removed the spasms were very considerably reduced in number and strength, and he felt greatly relieved, so that he was in no way ready to take my advice and have the right supraorbital nerve resected also.

Gradually, however, it became apparent that, although the spasms in the upper lid were almost totally wanting, every few minutes the lower left lid would be pulled up and remained fixed for a few seconds in such a position that sight was as much impaired as before. Still, he managed to do some work and would not submit to a further operation, as long as he was able to do this.

On December 21, finally, he was convinced that something more was necessary to allow him to keep on working. Accordingly on that day, with the assistance of the same gentlemen, I performed neurectomy of the supraorbital nerve on the right side, in the same manner in which I had done the same on the left side. Then I resected both infraorbital nerves.

In order to find this nerve, a T-shaped incision was made, the vertical incision in a line from the inner margin of the cornea to the interstices between the first and second molar tooth, beginning at the infraorbital margin and going through skin and muscle down to the *pes anserinus* in the *fossa canina*. The horizontal incision was made along the infraorbital margin. I was prepared to chisel open the infraorbital canal, but on

grasping the nerve and pulling it cautiously forward I found that I could easily resect a piece, about three-quarters of an inch in length, which I accordingly did.

The healing after these operations took place rapidly and without disturbance. The result was very gratifying to the patient, but not to me—that is, the spasms were very weak at first, and did only come on at long intervals. He was able to work in proper light for two hours at a time, but it was at once evident that the facial spasms, which, before the operations had seemed of no importance, grew worse now. When I saw him last, he was still very grateful for what I had done for him, and was able to make a living by his work; but I could not understand why he should feel so grateful, since the facial spasms closes his eyes almost as effectually as the lid spasms had done, but perhaps at longer intervals. Of course, the patient and the surgeon do not judge from the same standpoint.

SELECTION.

NOTES OF A LECTURE ON SOME FORMS OF RETINAL PIGMENTATION.

BY W. ADAMS FROST, F.R.C.S.

Delivered at the Royal Westminster Ophthalmic Hospital.

I do not propose here to deal at all exhaustively with the subject of pigmentation of the retina, but merely to illustrate some forms in which it occurs, which appear to me to be in some degree typical of their kind. It is, I believe, generally admitted that in all cases in which pigment is found in the anterior layers of the retina, its source is the layer of hexagonal pigmented cells which is now considered to form the deepest layer of that membrane. The most common cause of pigmentation of the retina is undoubtedly choroiditis, and although it must be considered an established fact that the pigment layer is histologically a part of the retina, yet clinically it is much more intimately associated with the choroid, participating as it does, very readily in affections of this membrane, and often escaping in affections of the retina—not even accompanying it when it becomes detached from the choroid.

It is a curious feature about pathological pigmentation of the anterior layers of the retina that it is always associated, sooner or later, with de-pigmentation of the layer that normally contains pigment; to what extent these two processes are correlated as cause and effect I will not now consider.

I propose to consider some cases of retinal pigmentation which have at any rate this in common, that they are secondary to choroiditis. Examples of these are given in the accompanying lithographic plates.

Fig. 1 is an illustration of one form in which pigmentation of the retina may occur as a physiological peculiarity. The pigment is arranged in groups, each being formed by an aggregation of small black dots varying from 2 to 6 in number. These groups are scattered over a wedge-shaped area, having its apex at its optic disc, and its sides formed by the inferior nasal and inferior temporal vessels. The painting was made from a child who had normal vision, the visual field was not taken. I have seen another very similar case[1] in which the individual groups were larger but fewer in number; in this case the fundus-red was rather darker than usual. The subject was a boy, æt. 13 years. There was total hypermetropia of 2.75 D.; the vision was normal. A case very similar to these is figured in Wecker and Jaeger's *Atlas* (Fig. 76.) under the title "New-Formation of Pigment." In this also, vision was normal.

There can be no doubt that these are examples simply of a physiological peculiarity analogous to that which occasionally causes one sector of the iris to present a pigmentation which is in contrast with the remainder.

For the opportunity of obtaining drawings of this and many other physiological pecularities of the fundus I am indebted to Mr. S. Stephenson, at the time that he was assistant medical officer of the South Lambeth schools.

Fig. 2 and 3 are examples of retinitis pigmentosa in an early and late stage respectively. The name of this disease is in such general use that it would be idle to attempt to change it, yet in many respects it is misleading; for in the first place the disease is much more of a degenerative than of an inflammatory type; in the second place, pigmentation of the retina occurs in other conditions; and in the third, in many cases which must certainly be included under the titie, retinal pigment is present in quite an insignificant amount (as in Fig. 3). The name, however, is comparatively unimportant as long as it is by general consent taken to refer to a definite clinical entity, of which the

[1]These and other allied conditions were illustrated by lantern slides projected on a screen.

objective symptoms are night-blindness and a gradual diminution of the visual field with retention of fair central vision, the whole running an eminently chronic course, extending over many years. At the same time there are the characteristic objective signs to be seen with the ophthalmoscope, namely, pigmentation, of the superficial layers of the retina, which allows the choroidal vessels to become visible.

Now, the term "retinitis pigmentosa" tends to exalt the value of the one factor in the disease at the expense of the other. Even some of our best tex-books are free from ambiguity as to the value that is to be attributed to atrophy of the pigment layers as a symptom in this disease. Thus, in Dr. Berry's *Diseases of the Eye*, page 162, we find that, "typical cases of retinitis pigmentosa are quite different from the variety following severe syphilitic choroiditis, and are easily recognized by the delicate shapes of the pigment deposited in the retina, its relation to the vessels, and the absence often of any disappearance of the pigment in the hexagonal cells;" but, on page 275, we find that in true retinitis pigmentosa "there is usually a conspicuous defect in the pigment or the hexagonal cells, which allows the choroidal vessels with their pigmented interspaces to come into view."

I do not think sufficient stress has been laid by writers upon the fact that, as the disease progresses, the affected area becomes more extensive, but no proportionate increase takes place in the amount of pigment in the area of the fundus first affected. My own expression is—although I should like to see more cases before forming a positive opinion on the point—that the pigmentation diminishes in the later stages of the disease, and from the cases I have seen I should consider that Figs. 2 and 3 may be taken as fairly typical examples of the early and late stages of the disease.

Fig. 2 is a painting from the left eye of a girl, A. M., æt. 23 years. She is the third of 5 children, the others being stated to be free from any affection of the eyes. One brother and one sister were seen by me, and their eyes were normal in all respects. The parents are both living, and stated to be in good

health; they are are not blood relations. The patient herself is anæmic, but otherwise in good health. There are no signs of inherited syphilis, and no history or likelihood of the disease having been acquired.

In January, 1887, the patient first noticed that the sight of the left eye was not as good as it had hitherto been; she did not notice that the defect was greater at night. An attack of conjunctivitis appears to have directed her attention to the eye. Since then the patient thinks that the sight has gradually deteriorated; but this seems to be due rather to continued contraction of the visual field than to any actual lowering of the visual acuity.

She was first seen by me in February, 1888, at St. George's Hospital. The vision was then, in both eyes, $^{6}/_{XII}$, improved by 0.50 D. to $^{6}/_{IX}$. The visual field in the right eye was practically normal; in the left it was at first thought to be contracted concentrically to about 20°, except below. A subsequent examination showed this to be a mistake, and that beyond this central field, and separated from it, except below, by a blind area, was a peripheral band of functionally active retina; in fact, the condition was analogous to the ring scotomata occasionally seen in this disease, but the ring was incomplete below, while above its breadth caused it to reach beyond the confines of the normal field. The light-sense was found to be very defective. With Foster's photometer, but with a different illumination and test object than used by him, the right eye required an aperture having a diameter 14 mm., and the left 20 mm., while the average of 10 normal eyes gave 3 mm. as the minimum aperture required. With the ophthalmoscope the right eye showed a few streaks of pigment at the extreme periphery; the disc and vessels were normal. In the left eye the appearances were those depicted (Fig. 1). It will be seen that there is a considerable amount of pigment in the peripheral parts of the retina, and that this is made up of fine dots, which, by giving off processes that anastomose with others, form a network over the affected portion. It will also be seen that the pigment layer of the retina is atrophied in places, so that the choroidal

vessels are visible, but the pigmentation is a more prominent feature of this case than the atrophy of the pigment layer. The retinal vessels are somewhat diminished in size, and the disc has a peculiar dull dirty hue. The drawing was not made till July, 1888, but no appreciable change had taken place in the appearances since the patient was first seen.

The vision during the whole time has fluctuated somewhat, without any obvious cause. At the last visit, on April 4, 1889, it was still $^{6}/_{IX}$, but on October 3, 1888, at the hospital, it was noted a being $^{6}/_{XVIII}$, and the next day it was only $^{6}/_{XXXVI}$, when tested at my house; the illumination on the latter occasion was certainly not worse than on the former. The visual field has been tested several times, but no appreciable variation has been found.

Fig. 3 illustrates a much later stage of retinitis pigmentosa. It is from the left eye of J. D., æt. 35 years. When I first saw him on August 19, 1885, vision had been failing very gradually for ten years; the defect was at first only noticed at night, and it has always been much worse then. In 1879 he attended the Royal London Ophthalmic Hospital for iritis; it does not appear that the fundus was examined at that time; and unless the patient had mentioned that he suffered from night-blindness, the ophthalmoscope, of course, would not have been used. The attack was evidently a very slight and transient one. It is interesting to note that the vision was then tested and noted as being $^{20}/_{LXX}$, improved by —2 D. to $^{20}/_{XX}$ (that is, approximately, $^{6}/_{XXIV}$ and $^{6}/_{VI}$).

When first seen by me the vision of each eye with —2 D was $^{6}/_{IX}$; since then it has very slowly got worse, with slight fluctuations; and on November 16, 1889, it was $^{6}/_{XVIII}$. The patient has for several years taken iron, sometimes leaving it off for a few months; he is an intelligent man, and holds a very strong opinion that his vision is better while taking the iron. I have not been able, however, to satisfy myself of the accuracy of this belief.

The visual fields have also undergone a slow but steady contraction while the patient has been under observation. In

1885 that of the right eye had a radius of 20° upwards, and 22° downwards, 25° outwards, and 10° inwards. The left eye 18° upwards, 35° downwards, and 20° to each aside. On November 16, 1889, the right field measured had a radius of 10° in all directions, while the left was the same, except that it was prolonged outwards to 20°.

The ophthalmoscopic appearances have not appreciably altered since he first attended; in several respects they differ considerably from those seen in the preceding case. The pigment is comparatively scanty, but its arrangement is characteristic; it is most abundant at the periphery, but it approaches nearer to the centre than in the preceding case. It consists of dots and lines, from which fine processes are given off; these, in places, anastomosing with other processes, form an irregular network; the pigment evidently lies quite in the superficial layers, and in one place follows a retinal vein as if lying within its sheath. The atrophy of the pigment layer, on the other hand, is more extensive, and reaches right up to the optic disc. The latter also shows atrophic changes, and the retinal vessels are diminished in size.

Fig. 4 differs at first sight greatly from the preceding cases. The most striking feature about it is the enormous number of choroidal vessels that are visible, owing to the atrophy of the pigment layer of the retina. The atrophic process has also tended to the capillary layer of the choroid, with the result that, except in a few places where this layer remains intact, the normal red groundwork has given place to a dirty brown. The choroidal vessels also near the disc appear to have undergone morbid changes which have rendered their walls white and opaque. There is but little pigment, but what there is is arranged much as that in typical retinitis pigmentosa.

The drawing was made from the right eye of E. S., æt. 55 years, at present a workhouse inmate. At the age of 21 he enlisted; he served in India for about twelve years, and left the army in 1871. A year later his sight began to fail; at first the defect was only noticed at dusk, but there has since been a gradual deterioration of vision, although the defect has

always been much greater at night. Notwithstanding the extensive changes in the fundus at the time the painting was made, central vision with this eye was three letters of $^{6}/_{XII}$ in ordinary daylight; at night-time he was as helpless as a blind man. The visual field was contracted to about 20° in all directions, conditions which correspond with the freedom of the region of the yellow spot from disease. In the left eye the changes were very similar, but a little more advanced, vision being reduced to hand-reflex.

A case that is almost identical with this has been recorded, and figured by Mr. Standford Morton in the Transactions of the Ophthalmological Society, vol. v. In this case the central vision was normal at the time the drawing was made, but the visual field was much contracted. When I saw the patient fifteen months later, the vision was $^{6}/_{XVIII}$, but it probably varied.

It seems to me that these cases are strictly analogous to true retinitis pigmentosa, or, at any rate, that it would be well to place them in this category till we obtain fuller knowledge. The clinical symptoms are identical, and the difference is chiefly in the greater prominence of the atrophic changes and the comparative insignificance of the pigmentation, but these are differences in degree and not in kind, and are possibly to be accounted for by the late appearance of the disease. I should provisionally look upon these cases as examples of senile retinitis pigmentosa, of course using the term "senile" merely in a relative sense.

NINTH MEETING OF THE OPHTHALMOLOGICAL SOCIETY, HEIDELBERG, SEPTEMBER, 13 to 15, 1889.

(*Hirschberg's Centralblatt*).

The Graefe-prize for the best paper published in *Graefe's Archives*, during 1884 to 1886, was given to Professor Deutschmann, at Hamburg, for his article: *On the Pathogenesis of Sympathetic Ophthalmia* (*Ophthalmia Migratoria*) (Vol. XXX). At the same time Dr. W. Uhthoff's article: *Studies Concerning the Influence of Chronic Alcoholism on the Human Organ of Vision* (Vol. XXXII) was honorably mentioned.

1. Mr. Kniess (Freiburg): *On Disturbances in Color-Perception Accompanying Atrophy of the Optic Nerves.* Kniess observed three cases of atrophy of the optic nerves with disturbance of the perception of colors. In the first case, visual acuity was normal, the visual field was contracted up and outward. With the worsted color-test, partial green-blindness was found. In the second case, the visual acuity was one-third, the visual field was concentrically reduced, and yellow was not distinguished from orange. In the third case, there was a central scotoma for green, which disappeared in intense light. Kniess thinks, that the seat of color-perception is not in the retina, but in the cortex of the brain.

Mr. Meyer (of Paris) asks whether in these cases there was not a diminution of the light-sense.

Mr. Foerster (Breslau) states, that the light-sense is not affected in cases of atrophy of the optic nerve.

2. Mr. Uhthoff (Berlin): *On Anomalies in the Motility of the Eyes in Multiple Sclerosis.* Uhthoff examined 100 cases of multiple sclerosis, and found paralyses of ocular muscles in 17% of

them; there was six times paralysis of the abducens, three times of the oculomotorius, three times of associated movements, three times of the internal rectus, and twice ophthalmoplegia externa. These paralyses are of central origin and appear in the later stages of the disease. They often affect both sides. Paralyses of the ocular muscles are much more frequent in dorsal tabes; he found paralysis of the oculomotorius in 26%, and paralysis of the abducens in 12%. Complete ophthalmoplegia interna accompanies tabes; contrary to what is found in sclerosis, the ophthalmoplegia externa is but rarely seen. Nystagmus is often found in sclerosis, about in 12%, and nystagmus-like contractions in 46%. Nystagmus is, therefore, of great pathognomic value for the diagnosis of disseminate sclerosis. The paralyses differ from tabetic ones, by being accompanied by the nystagmus-like contractions, while the latter are combined with reflex-immobility of the iris. In cases of sclerosis the pupil shows little that is abnormal; Uhthoff saw only one case of reflex-immobility of the iris, and but three times a difference in the size of the pupils.

3. Mr. Fischer (Dortmund): *On Keratitis with the Formation of Thread-like Excrescences on the Cornea.* Fischer differentiates three different kinds of this keratitis. In one of them small vesicles are formed on the surface of the cornea, in the second diffuse opacities are observed, and in the third small threads are seen to protrude from opaque points in the cornea. Fischer believes, that these are formed by coagulated fibrine coming from the cornea, and that in character they are similar to Curschmann's spirillæ from the bronchi.

Mr. Leber, also, considers these threads to be coagulated fibrine, but he believes, that their origin is in the conjunctival secretion.

Mr. Uhthoff defended the opinion of Mr. Fischer.

4. M. St. Valude (Paris): *On a New Designation of Prisms.* Valude proposes to designate prisms by their angle of deflection.

5. Mr. C. Hess (Prage): *On the Color-Sense in Indirect Vision.* Hess states that in normal vision the fields for red

and green are differing but slighty, and that this difference is due to the fact, that the tests which appear as equally light tints of green and red, are not equal in reality when compared with white. When they are rendered equivalent the differences of the fields disappear. Hering has constructed an apparatus by which his statements are easily proven.

6. Mr. Wagenmann (Gœttingen): *On Purulent Infiltration of the Vitreous Body, Taking Its Origin from Scars of Former Operations and from Anterior Synechiæ.* Wagenmann examined 18 eyes, in which an operation and subsequent anterior synechia were followed by purulent infiltration of the vitreous body. He found in every case an infection starting from the scar. Cystoid scars are especially favorable to such an infection. The time varies considerably; months, years, or even decades may intervene. As such a scar becomes gradually more elastic, the wall gets thinner, and, in consequence, there is a better chance for an infectious material to penetrate to the interior of the eye. It was always possible by anatomical examination to trace the pus, or rather the cocci, from their entrance at the scar to the interior of the vitreous body. In one case the presence of the staphylococcus was proven by inoculation; in all other cases by anatomical means only. The blood-vessels never contained any cocci.

Mr. Meyer believes that the infection may just as well be endogenous. In this case the scar would have to be considered simply as a *locus minoris resistentiæ.*

Mr. Leber does not believe in endogenous infection, since the cocci are found in the scar and in the vitreous body only, while the blood-vessels never contain them.

Mr. Schmidt–Rimpler agrees with Mr. Meyer, and states that the formation of pus is very frequently preceded by a disturbance in the general system.

7. Mr. E. Fick: *On the Recuperation of the Retina.* It is a well-known fact that the retina tires easily. Therefore, certain conditions must be in existence, which regulate this tiring. Fick considers the movements of the eyeballs, the movements of the eyelids, and the play of the muscles of accommodation

to be such regulators. By these movements the intraocular pressure is increased. Even if this increase be but slight, the circulation of the blood in the retinal blood-vessels is thereby furthered.

Mr. Becker draws attention to the fact that changes in the intraocular pressure involve especially and, at first, the chorio-capillary blood-vessels and the pigmented epithelial cells, and in this manner the production of the visual substance [purple? Translator] is influenced.

Mr. Snellen thinks that seeing nebulæ is not due to any trouble in the retina, but is caused by the tear-fluid and particles of dust on the cornea. The beneficial influence of the movements of the lids and the eyeballs would thus be easily explained.

Mr. Leber agrees with this view, and thinks that we must, moreover, not lose sight of the change in the site of the images upon the retina.

8. Mr. Weiss (Heidelberg): *Contributions to the Anatomy of the Retina.* Weiss relates the results of the measurements of the orbits of several hundred skulls.

Second Meeting, September 14.

1. Mr. Wicherkiewicz shows a new model of his shells for covering eyes when treatment by darkness is required.

2. Mr. Schoen (Leipzig): *On a New Symptom of Traction in the Myopic Eye.* Schoen outlines in a few words the anatomical changes in the ciliary muscle and Schlemm's canal in the myopic eye. If a tangent be drawn through the ciliary body of a myopic eye which has been cut in two in a horizontal direction, Schlemm's canal on the temporal side lies behind the tangent, and on the nasal side in front of it. This explains why the internal rectus muscle during convergence does not only pull on its insertion, but also on the neighboring sclerotic and cornea, and thus actually pulls the outer membrane over the inner membranes, especially over the region of the ciliary body.

Messrs. Kniess and Stilling speak against this theory.

Mr. Mayweg (Hagen): *On Recurring Hæmorrhages into the Vitreous Body.* A young man had lost one eye totally by hæmorrhages into the vitreous body when Mayweg observed a hæmorrhage taking place in the fellow-eye, so that vision was reduced to the seeing of the movements of the hand. In order to prevent total blindness, he ligated the carotid artery. No further hæmorrhage then took place. A year later V.= $^{20}/_{XL}$.

Mr. Nieden speaks against such heroic remedies and recommends internal treatment, which, he thinks, will hardly ever fail.

Mr. Snellen is against any and all operative procedures in cases of philæmia.

4. Mr. Menacho (Barcelona): *On Jequirity in the Treatment of Diseases of the Conjunctiva and Cornea.* Menacho uses jequirity in all forms of pannus, even when there is no trachoma, and in sclerosis of the cornea. He uses it as a powder, which he dusts on the everted lids and which he allows to act there for from 2 to 5 minutes. He has never observed any complications.

Mr. Sattler thinks the use of jequirity is indicated in certain forms of trachoma only, while Pagenstecher and Gunning speak of it as a very unreliable remedy.

5. Mr. Menacho read a further paper: *On Subconjunctival Sclerotomy.*

6. Mr. Kamoki (Warschau): *On Hyaline Degeneration of the Conjunctiva.* The author describes the results of a series of anatomical examinations of hyaline degeneration of the conjunctiva.

7. Mr. Schweigger (Berlin): *On the Objective Diagnosis of the Refraction.* Schweigger extols the advantages of the objective diagnosis of the refraction by means of the shadows, and demonstrates an ophthalmoscope he has modified for this method of examination.

MEETING FOR DEMONSTRATIONS SEPT. 14, 3 P.M.

1. Mr. Kuhnt (Jena) demonstrates two illustrations for teaching: 1. A frontal section through the head. 2. Schematic arrangement of the finer structure of the retina.

2. Mr. Ferrer (San Francisco) shows the modified opthalmometer of Javal.

3. Mr. Schœn (Leipzig) shows microphotographic illustrations of beginning cataract.

4. Mr. Sattler (Prag) demonstrates pure cultures of cocci from the conjunctival sac. By means of a new method recommended by Kroll at Prag, these cultures were rendered permanent.

5. Mr. St. Valude (Paris) shows specimens of an eye with a rare form of staphyloma of the cornea.

6. Mr. Bernheimer (Heidelberg), specimens of a typical lymph-adenoma of the orbit.

7. Mr. Dinkler (Heidelberg), microscopical specimens of miliary tuberculosis of the choroid.

8. Mr. Whiting shows frontal and sagittal sections through heads of human embryos.

THIRD MEETING, SEPTEMBER 15.

1. Mr. Becker (Heidelberg): *Contributions to the Anatomy of Detachment of the Retina.* Becker distinguishes between three forms of detachment of the retina: 1, when the whole of the retina and the pigment epithelium are detached; 2, when the pigment-epithelium remains *in situ*; and 3, when both conditions obtain. According to Kuehne the function of the retina returns, as soon as the cones come once more in contact with the pigment-epithelium, as proven by experiments on frogs. Might this not also be the case when a retina has been but recently detached in man? In old cases the rods and cones are degenerated. In practice the cases are mostly of this kind.

Mr. Leber thinks that in recent cases the rods and cones are usually not much degenerated; yet, the function of the de-

tached parts is, as a rule, destroyed, even if they become reattached. Of course, the locality of the detachment is of great importance.

Mr. Schweigger believes that by ophthalmoscopic examination we find but very rarely any pigment epithelium attached to the detached retina. In speaking of the treatment he relates that he has tried the method of Schöler, namely, the injection of tincture of iodine, in eight cases. The results were *nil*, or even directly bad. In the best cases the eyes stood the injection of iodine well. He is forced to warn the colleagues against the employment of this remedy. He doubts that there was really a detachment of the retina in the case reported by Schöler.

Mr. Uhthoff does not consider this method as without any value; at least from what he has seen in Schöler's cases. He is of the opinion that this method is worthy of employment and trial.

2. Mr. Dimmer (Vienna): *On the Treatment of Total Scars of the Cornea with Anterior Synechiæ.* Dimmer has made a series of experiments on rabbits to implant an artificial transparent cornea in cases of leucoma of the cornea with anterior synechiæ. To this end he used small transparent shells of celluloidine which he implanted into small openings cut out with a trephine. After having been successful in a series of cases on rabbits, he operated in the same way on patients. In two cases the shells remained stationary, and one patient could count fingers at 2 or 3 meters distance. Since the operation eleven weeks have elapsed, and this result remains unimpaired.

Mr. von Hippel believes that although these shells may remain adherent for a time, they will finally fall off. He has made similar experiences with other materials.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, NOVEMBER 14, 1889.

J. HUGHLINGS JACKSON, M.D., F.R.S., President, in the chair.

Recovery from Hemianopsia, with Subsequent Necropsy.—Mr. Doyne read notes of a case occuring in an old man. The onset of hemianopsia (right-sided and homonymous) was sudden; fields of vision recovered in the course of a fortnight, but subsequently a quadrant of the oposite side of each field was lost. Death occurred from cerebral apoplexy. At the necropsy, in addition to the extensive extravasation which caused death, there were found symmetrical lesions (softening) on both sides of the brain in the cortex of the occipital lobe, one evidently more recent than the other.

Homonymous Hemianopsia; Recovery; Subsequent Death and Necropsy.—Dr. James Anderson gave an account of the case of a warehouseman, æt. 41 years, sent to him by Mr. Warren Tay on March 28, 1889, complaining of failure of vision for 6 weeks with severe frontal headache, and during the previous week much failure of memory and mental depression. He had been losing flesh for 4 months, had had no fit, no vomiting, and no loss of sensation or of motor power so far as he knew, but during the previous week he had had two severe falls from inability to see to his right side, and his speech and general manner had altered in character. The family and personal history threw no light on his trouble. He had eight healthy children, and denied all history of venereal disease. He was much depressed about himself, thin and anxious, and had some difficulty occasionally in finding words, but there was no loss of

gross motor power or general or special sensation except as regards vision. His gait and reflexes were normal, and the heart, lungs and kideys apparently healthy. The ocular and pupillary movements were normal, and with the exception of an old nebula on the left cornea there was no pathological change in either eye, the discs and fundi being quite healthy. He could read J. 1 with each eye separately, but only with difficulty. The right halves of both visual fields were lost up to but not including the line through the fixation point; the left halves were of average extent. From the symptoms, Dr. Anderson concluded that the patient had an intracranial growth, probably malignant, and situated in the medulla of the left occipital lobe, also that a hæmorrhage had taken place into the tumor at the begining of the previous week. He was admitted on March 29, into the London Hospital, and prescribed full doses of sod. iod. and liq. hydrarg. perchlorid. Perimeter charts taken on March 31, by Dr. Charles Wilson showed right homonymous hemianopsia with some contraction of the remaining left half of the right visual field. Within a fortnight the headache and mental symptoms had much subsided, and the perimeter chart of April 18 showed only slight contraction of the right halves of the visual fields. Mr. Grimshaw, the clinical clerk, who watched the fields from day to day, believed that the right halves varied considerably, being smaller on days when there was severe headache. The patient left the hospital on May 18, was seized with severe headache and vomiting on May 22, and on May 29, had a transient attack of left hemiplegia, which had quite passed off when he was readmitted into the hospital on June 20. The lower quadrants of the right halves of both visual fields were at this date deficient nearly up to the vertical line through the fixation point, especially on the left side, but otherwise the fields were of good extent, and reading vision was still J. 2 with the right and J. 3 with the left eye, and the fundi were normal. From this time he rapidly deteriorated in mind, and became extremely troublesome; his vision seemed to be more defective, but he would not allow his eyes to be examined. On August 9,

he was sent to Banstead Asylum, where he continued in a demented state and died on October 1.

The necropsy made by Dr. Clay Shaw showed a recent blood clot in the posterior cornu of the left lateral ventricle of the brain, with hæmorrhage and softening in the tissue external to this, involving the whole of the angular gyrus up to its surface, the central part of the area being occupied by a walnut-sized cavity containing a straw-colored fluid. The tissue replacing the angular gyrus was found to be gliomatous in structure. The rest of the brain and the remaining organs of the body seemed to be healthy, and there was no evident explanation of the temporary left hemiplegia observed four months before death. The improvement of the patient under antisyphilitic treatment and the subsequent transient left hemiplegia caused some doubt as to the early diagnosis, which was, however, confirmed by the necropsy. Dr. Anderson stated that he had not previously met with a case of recovery from hemianopsia, that in cases of hemianæsthesia with hemianopsia, for example, from a vascular lesion in the area of the posterior cerebral artery, even when the former group of symptoms disappeared, the latter, very generally at least, persisted. Hæmorrhage had in this case pretty certainly taken place into the tumor at the date of the patient's coming under observation, and a second hæmorrhage into it had been the immediate cause of death. The case was interesting in relation to modern views of visual localization.

The President said that the subject of the two papers just read concerned the very important question of cerebral localization. He mentioned two cases which had been under his own care; in one hemianopsia was associated with hemianæsthesia, in the other there was much mental confusion, but neither hemiplegia nor hemianæsthesia; he also referred to the frequent association of hemianopsia and word blindness.

Dr. Hill Griffith inquired if Dr. Anderson's case had exhibited the hemiopic pupillary reaction.

Dr. S. J. Taylor spoke of a case of hemianopsia in which the fields of vision regained their normal limits. Death occurred shortly after, but no necropsy was obtained.

Dr. Stephen Mackenzie thought that the two cases now reported pointed rather to the hemianopsia being due to pressure exerted by hæmorrhage on the parts of the brain concerned in vision. The fluctuations in the fields of vision during recovery lent support to that view rather than to the supposition that the function was taken on by some other part of the brain. He considered that the symptoms were caused by vascular changes in propinquity to the visual centres and the fluctuations in the field by variations in blood-pressure.

Mr. Lang referred to two cases of recovery from hemianopsia, and supported Dr. Mackenzie's views.

In reply, Dr. Anderson said that in his case the pupil acted well to light thrown on to either half of the retina. In Mr. Doyne's case it was certain that the two areas of softening in the brain were of different dates; the older patch being in the site of the hæmorrhage which occurred at the time of onset of the hemianopsia; the more recent patch marking the lesion which caused the subsequent loss of a quadrant of the fields in their opposite halves.

On the Size of the Cornea in Relation to Age, Sex, Refraction, and Primary Glaucoma.—Mr. Priestly Smith gave an account of certain facts obtained by measurement of the cornea in a large number of human eyes. The inquiry had been undertaken to test the truth of a suggestion he had previously made to the Society, namely, that small corneas were specially connected with a liability to glaucoma in its primary form. The measurements were made by means of a simple keratometer devised for the purpose.[1] The horizontal diameter only was measured, and the nearest half-millimetre was noted. The eyes examined were chiefly those of private and hospital patients with refractive errors or slight ailments such as could not invalidate the result. A number of healthy eyes of old people in a workhouse and an almshouse were also examined. A number of persons affected with primary glaucoma were examined in like manner. The normal cornea: 250 males and

[1] See Ophthal. Review, November, 1886.

250 females were examined, giving a total of 1,000 eyes, representing all life periods from 5 to 90 years of age. Age, sex, and refraction were noted in every case. Analysis gave the following results: general average 11.6 millimetres, size variable in individual cases, but not often greater than 12 or less than 11 millimetres; number greater than 12, 34 per 1,000, namely, 12.5, 30 eyes; 13, 2 eyes; 13.5, 2 eyes; number less than 11, 17 per 1,000, namely, 10.5 in every instance. Stature and size of head were not systematically noted, but there were many larger corneas in smaller persons and smaller corneas in larger persons, and therefore no general proportional relation existed in this respect. Classification according to age gave the following results: average between 5 and ten years, 11.67; between 10 and 20, the same; between 20 and 40, nearly the same; after 40, rather smaller, but the difference not large enough to be very positively asserted. The cornea, then—or at least its visible part—attained its full diameter very early in life, many years before the rest of its body completed its growth. Comparison of other data relating to size and weight of different parts during intra- and extra-uterine life (quoted from Vierordt and Manz) showed that the development of the cornea was precocious in relation to that of the eye as a whole; that of the eye in relation to that of the brain; that of the brain to that of the whole body. In advanced life the height of the body and the weight of the brain diminished; the apparent slight diminution of the cornea at the same period might perhaps represent an actual shrinkage due to the same slackening of nutrition, but this was merely a suggestion. Classification according to sex showed a very slight but probably a real difference in each life period, the cornea of the male being on the average about one-tenth of a millimetre the larger. Classification according to refraction showed the unexpected fact that the size of the cornea bore no relation to the refraction, being no smaller in hypermetropia, no larger in myopia, than in emmetropia. This was further proved by comparison of 90 highly hypermetropic with 90 highly myopic eyes. The size of the cornea was determined early in life, and was not affected by the

greater or smaller extension of the posterior hemisphere which might occur later. The cornea was full grown at 5, or earlier; at any rate it did not add one-tenth of a millimetre to its diameter after that age. The lens, a near neighbor of the cornea, was full grown only at the other end of life, and, if the life were a long one, added at least 2 millimetres to its diameter after the cornea had ceased to enlarge. This involved a gradual change in the mutual relations of the two which might have important consequences. The cornea in primary glaucoma: Sixty-nine persons having primary glaucoma in one or both eyes were examined in like manner. Number of glaucomatous eyes, 99; healthy, 32; some of the patients had lost one eye; the statistics comprise the whole. Average, 11.27; maximum, 12; minimum; 10. Number of corneas measuring less than 11 millimetres (spoken of as "small corneas"), 34, that was, 26 per cent. Comparing the glaucoma group with the same life periods in the healthy group, the small corneas formed 26 per cent of the one, 4 per cent of the other. More important even than this, among the 1,000 eyes of healthy persons there was not one cornea so small as 10 millimetres, while there were 9 such in the much smaller glaucoma group. A definite relation between the small cornea and primary glaucoma was thus proved. The explanation lay, in the speaker's opinion, in an undue proximity between the lens and the surrounding structures. But this explanation raised certain questions which called for an answer. Was the smallness of the cornea a consequence of the glaucoma? The changes occurring at the angle of the anterior chamber might be supposed to opacify the corneal margin. This idea was disproved by the fact that in 7 of the glaucoma patients both corneas were small, while only one eye was glaucomatous; in one of these the other eye was attacked later. This showed that the smallness of the cornea preceded the glaucoma, and was not caused by it. Was the small cornea small from youth up, or did it become so in later life? There were grounds for holding the latter view; small corneas were much commoner in the second half of life; but they were not entirely wanting in early life,

and might at that early age be associated with glaucoma (witness Mr. Hartridge's case shown to the Society on March 11, 1886). When the cornea was small, was the globe small in proportion? As shown already, the refraction gave no answer to that question; it could only be determined by a sufficient number of measurements of cornea and globe. In a recent case of the speaker's what appeared to be a faultless iridectomy, on a glaucomatous eye with a 10 millimetres cornea, was followed by no relief of the glaucoma. On excision some months later the eye proved to be exceptionally small, like the cornea, namely, 21 millimetres antero-posteriorly by 21 vertically by 22 horizontally. The refraction of this eye had been 5. D of hypermetropia. Lastly, was the small cornea associated with a proportionately small lens? If so, the speaker's explanation of the matter fell to the ground. In the case described the failure of the operation had arisen through obstruction of the wound, which could not have been made more peripherally, by the margin of the lens. Other specimens in the speaker's possession showed the same result. In the important case published by Hocquard and Masselon—microphthalmos with glaucoma—the eye resembled the one above described, but in an exaggerated form, and the lens was found to be "much too large for the eye." The structural conditions in question—large lens, small cornea—were not necessarily present in primary glaucoma, for the disease could occur in the absence of both; but they were conditions which either singly or together gave to certain eyes a greater than ordinary predisposition to it.

Treatment of Symblepharon.—Professor Snellen (Utrecht) described an operation for the cure of symblepharon, which had given him very satisfactory results. His plan was to free the adherent lid, leaving any conjunctiva which might be present attached to the globe. A flap of skin was then dissected from the cheek, having a narrow pedicle close to the border of the lid near the outer canthus; a buttonhole being made beneath this flap from the inner surface of the eyelid, the flap was drawn through and attached to the raw surface of

the lid. The conditions were peculiarly favorable for plastic operations, and Professor Snellen had been much pleased with the vitality shown by the flap. This plan had also proved of value in enlarging a socket for the reception of an artificial eye.

A New Operation for Ptosis.—Professor Snellen had recently adopted the following operation for cases of ptosis: A ligature was passed from without inwards through the entire thickness of the lid at the upper edge of the tarsus; the needle was then passed outward through all the structures but the skin at a point near the upper limit of the conjunctival sac, and made to perforate the skin near the original puncture. The ends of the ligature were then tied tightly on the surface of the lid. Three such ligatures were employed, disposed rather towards the nasal side, on account of the position of the levator.

On the Treatment of Episcleritis.—Professor Snellen recommended the injection, once or twice a week, of a 1 to 5,000 solution of corrosive sublimate beneath the swollen and thickened conjunctiva and episcleral tissue. By this means he had obtained good results in a few cases of very intractable episcleritis.—*British Medical Journal.*

250 females were examined, giving a total of 1,000 eyes, representing all life periods from 5 to 90 years of age. Age, sex, and refraction were noted in every case. Analysis gave the following results: general average 11.6 millimetres, size variable in individual cases, but not often greater than 12 or less than 11 millimetres; number greater than 12, 34 per 1,000, namely, 12.5, 30 eyes; 13, 2 eyes; 13.5, 2 eyes; number less than 11, 17 per 1,000, namely, 10.5 in every instance. Stature and size of head were not systematically noted, but there were many larger corneas in smaller persons and smaller corneas in larger persons, and therefore no general proportional relation existed in this respect. Classification according to age gave the following results: average between 5 and ten years, 11.67; between 10 and 20, the same; between 20 and 40, nearly the same; after 40, rather smaller, but the difference not large enough to be very positively asserted. The cornea, then—or at least its visible part—attained its full diameter very early in life, many years before the rest of its body completed its growth. Comparison of other data relating to size and weight of different parts during intra- and extra-uterine life (quoted from Vierordt and Manz) showed that the development of the cornea was precocious in relation to that of the eye as a whole; that of the eye in relation to that of the brain; that of the brain to that of the whole body. In advanced life the height of the body and the weight of the brain diminished; the apparent slight diminution of the cornea at the same period might perhaps represent an actual shrinkage due to the same slackening of nutrition, but this was merely a suggestion. Classification according to sex showed a very slight but probably a real difference in each life period, the cornea of the male being on the average about one-tenth of a millimetre the larger. Classification according to refraction showed the unexpected fact that the size of the cornea bore no relation to the refraction, being no smaller in hypermetropia, no larger in myopia, than in emmetropia. This was further proved by comparison of 90 highly hypermetropic with 90 highly myopic eyes. The size of the cornea was determined early in life, and was not affected by the

greater or smaller extension of the posterior hemisphere which might occur later. The cornea was full grown at 5, or earlier; at any rate it did not add one-tenth of a millimetre to its diameter after that age. The lens, a near neighbor of the cornea, was full grown only at the other end of life, and, if the life were a long one, added at least 2 millimetres to its diameter after the cornea had ceased to enlarge. This involved a gradual change in the mutual relations of the two which might have important consequences. The cornea in primary glaucoma: Sixty-nine persons having primary glaucoma in one or both eyes were examined in like manner. Number of glaucomatous eyes, 99; healthy, 32; some of the patients had lost one eye; the statistics comprise the whole. Average, 11.27; maximum, 12; minimum; 10. Number of corneas measuring less than 11 millimetres (spoken of as "small corneas"), 34, that was, 26 per cent. Comparing the glaucoma group with the same life periods in the healthy group, the small corneas formed 26 per cent of the one, 4 per cent of the other. More important even than this, among the 1,000 eyes of healthy persons there was not one cornea so small as 10 millimetres, while there were 9 such in the much smaller glaucoma group. A definite relation between the small cornea and primary glaucoma was thus proved. The explanation lay, in the speaker's opinion, in an undue proximity between the lens and the surrounding structures. But this explanation raised certain questions which called for an answer. Was the smallness of the cornea a consequence of the glaucoma? The changes occurring at the angle of the anterior chamber might be supposed to opacify the corneal margin. This idea was disproved by the fact that in 7 of the glaucoma patients both corneas were small, while only one eye was glaucomatous; in one of these the other eye was attacked later. This showed that the smallness of the cornea preceded the glaucoma, and was not caused by it. Was the small cornea small from youth up, or did it become so in later life? There were grounds for holding the latter view; small corneas were much commoner in the second half of life; but they were not entirely wanting in early life,

and might at that early age be associated with glaucoma (witness Mr. Hartridge's case shown to the Society on March 11, 1886). When the cornea was small, was the globe small in proportion? As shown already, the refraction gave no answer to that question; it could only be determined by a sufficient number of measurements of cornea and globe. In a recent case of the speaker's what appeared to be a faultless iridectomy, on a glaucomatous eye with a 10 millimetres cornea, was followed by no relief of the glaucoma. On excision some months later the eye proved to be exceptionally small, like the cornea, namely, 21 millimetres antero-posteriorly by 21 vertically by 22 horizontally. The refraction of this eye had been 5. D of hypermetropia. Lastly, was the small cornea associated with a proportionately small lens? If so, the speaker's explanation of the matter fell to the ground. In the case described the failure of the operation had arisen through obstruction of the wound, which could not have been made more peripherally, by the margin of the lens. Other specimens in the speaker's possession showed the same result. In the important case published by Hocquard and Masselon—microphthalmos with glaucoma—the eye resembled the one above described, but in an exaggerated form, and the lens was found to be "much too large for the eye." The structural conditions in question—large lens, small cornea—were not necessarily present in primary glaucoma, for the disease could occur in the absence of both; but they were conditions which either singly or together gave to certain eyes a greater than ordinary predisposition to it.

Treatment of Symblepharon.—Professor Snellen (Utrecht) described an operation for the cure of symblepharon, which had given him very satisfactory results. His plan was to free the adherent lid, leaving any conjunctiva which might be present attached to the globe. A flap of skin was then dissected from the cheek, having a narrow pedicle close to the border of the lid near the outer canthus; a buttonhole being made beneath this flap from the inner surface of the eyelid, the flap was drawn through and attached to the raw surface of

the lid. The conditions were peculiarly favorable for plastic operations, and Professor Snellen had been much pleased with the vitality shown by the flap. This plan had also proved of value in enlarging a socket for the reception of an artificial eye.

A New Operation for Ptosis.—Professor Snellen had recently adopted the following operation for cases of ptosis: A ligature was passed from without inwards through the entire thickness of the lid at the upper edge of the tarsus; the needle was then passed outward through all the structures but the skin at a point near the upper limit of the conjunctival sac, and made to perforate the skin near the original puncture. The ends of the ligature were then tied tightly on the surface of the lid. Three such ligatures were employed, disposed rather towards the nasal side, on account of the position of the levator.

On the Treatment of Episcleritis.—Professor Snellen recommended the injection, once or twice a week, of a 1 to 5,000 solution of corrosive sublimate beneath the swollen and thickened conjunctiva and episcleral tissue. By this means he had obtained good results in a few cases of very intractable episcleritis.—*British Medical Journal.*